DOCUMENT RESUME

ED 480 660 SE 068 012

AUTHOR	Rushton, Erik; Ryan, Emily; Swift, Charles
TITLE	Invent a Backscratcher from Everyday Materials. Grades PreK-2.
INSTITUTION	Tufts Univ., Medford, MA.
PUB DATE	2001-00-00
NOTE	5p.; Produced by the Office for Technology and Industry Collaboration. For other activities in this series, see SE 068 011-041.
AVAILABLE FROM	Web site: www.prek-12engineering.org/activities/ .
PUB TYPE	Guides - Classroom - Teacher (052)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	Biology; *Creative Thinking; Early Childhood Education; Hands on Science; *Human Body; *Problem Solving; *Science Activities; Science Instruction; Student Motivation

ABSTRACT

Being able to recognize a problem and design a potential solution is the first step in development of new and useful products. In this activity, students create a device to get that pesky itch in the center of the back. Once the idea is thought up, students produce a design schematic (sketch). Students are given a variety of everyday materials and recyclables with which to create a back-scratching device. This activity uses a time frame of 45 minutes. (Author/SOE)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 480 660

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Activity: **Invent a Backscratcher from Everyday Materials**

GRADE LEVELS: PK-2

SUMMARY:

Being able to recognize a problem and design a potential solution is the first step to the development of new and useful products. In this activity students will be creating a device to get that pesky itch in the center of your back. Once the idea is thought up the students will produce a design schematic (sketch). Students are given a variety of everyday materials and recyclables. With these materials, students will need to create a back-scratching device.

LEVEL OF DIFFICULTY [1=Least Difficult: 5= Most Difficult]

5-most difficult

TIME REQUIRED

45 minutes

COST

low to none

STANDARDS:

1.3 Identify and describe the safe and proper use of tools and materials.

2.1 Identify tools and simple machines used for a specific purpose.

2.2 Describe how human beings use parts of the body as tools (e.g., teeth for cutting, hands for grasping and catching), and compare their use with the ways in which animals use those parts of their bodies.

WHAT WILL THE STUDENTS LEARN?

How to use creativity and everyday materials to build something useful.

www.ptek-12engineering.org
Copyright © 2001
All Rights Reserved

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

M. NEWELL

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

BEST COPY AVAILABLE

SEC08012

How to utilize designs and sketches in creating a product

BACKGROUND INFORMATION:

Vocabulary

Sketch: a rough drawing or plan of an idea.

Lever: a simple machine that utilizes a ridged bar and a fulcrum (pivot point) to raise or move an object.

RESOURCES:

http://www.vectorpark.com/levers.html -Nice demonstration about balancing a mobile (levers)

http://www.eecs.umich.edu/mathscience/funexperiments/agesubject/lessons/beakman/lever.html -Examples of different types of levers and description of lever, fulcrum, load, effort

http://www.brainpop.com/tech/simplemachines/lever/index.weml -Activities and demos for children, which show how levers are used and the concepts of load and effort.

http://library.thinkquest.org/J002079F/lever.htm -Short description of different lever classes with real world examples

MATERIALS:

Tape

String

Cardboard

Paper towel tubes

Scissors

Glue

Any other materials you wish to use. Students may also bring supplies from home.

Copyright © 2001
All Rights Reserved

PREPARATION:

Assemble materials.

You might want to build a backscratcher as an example to show the students.

Have students bring in any backscratchers they might have at home to show.

DIRECTIONS:

Class Discussion:

Ask, Why is it hard to scratch your back?

Discuss why new products are made and innovations take place. (They solve a problem or fill a need)

Have students show the back scratchers they brought in.

Discuss what a back scratcher is, why is it a useful device or tool.

Talk about formulating an idea and sketching a picture before construction.

Talk about what makes a good sketch, why are plans/sketches an important step in the design process.

Talk about there being more than one way to make a backscratcher? (bring up different brand names of the same product)

Activity:

1. Prepare a station with the materials that the students will use.

2. Students may work alone or in pairs.

2a. Always a good idea to talk about safety, do not eat the glue etc.

3. Introduce the activity to the students and allow them to examine the materials and brainstorm for ideas and sketch a design. Have the students explain their sketches to you before they start construction. Tell the students that they may use as many or as little of the materials available. (You may want to have the students explain their sketches to you before they are allowed to begin building).

4. Once the students have completed their backscratchers, have the students lay them out on a table so that everyone in the class can see each design. Encourage the students to try out the different backscratchers, but remind them to be respectful of everyone's designs.

Copyright © 2001
All Rights Reserved

5. After everyone has tested the designs, the class should decide which of the backscratchers was the most useful and have them explain what features they liked about it.

INVESTIGATING QUESTIONS:

What materials were the best to use for this project?

What would you have done differently?

What other materials could have worked?

What is a good design for a backscratcher?

REFERENCES:

none

Copyright © 2001
All Rights Reserved

SEC08012

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

Reproduction Release
(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: PreK-12 Engineering Activities

1) Touch and Discover, Grades PreK-2
http://www.prek-12engineering.org/data/d2/Touchdiscover.pdf

2) Invent a Backscratcher from Everyday Materials, Grades PreK-2
http://www.prek-12engineering.org/data/d28/Backscratcher.pdf

3) Compare Human-Made Objects with Natural Objects, Grades PreK-5
http://www.prek-12engineering.org/data/d34/HumanvsNatural.pdf

4) Do Different Colors Absorb Heat Better?, Grades PreK-2
http://www.prek-12engineering.org/data/d37/Absorbheat.pdf

5) Which Roof is Tops?, Grades PreK-2
http://www.prek-12engineering.org/data/d44/RoofTops.pdf

6) Make Your Own Recycled Paper, Grades PreK-2
http://www.prek-12engineering.org/data/d56/Recycle.pdf

7) Build an Approximate Scale Model of an Object Using LEGOs, Grades 3-5
http://www.prek-12engineering.org/data/d3/LegoScaleModel.pdf

8) Design Weather Instruments using Lego Sensors, Grades 3-5
http://www.prek-12engineering.org/data/d4/LegoWeather.pdf

9) Space Shelter, Grades 3-5
http://www.prek-12engineering.org/data/d5/SpaceShelter.pdf

10) Build a Bird House, Grades 3-5
http://www.prek-12engineering.org/data/d6/BirdHouse.pdf

11) Ball Bounce Experiment, Grades 3-5
http://www.prek-12engineering.org/data/d6/BallBounce.pdf

12) Make an Alarm!, Grades 3-5
http://www.prek-12engineering.org/data/d11/MakeAlarm.pdf

13) Design Packing to Safely Mail Raw Spaghetti, Grades 3-5
http://www.prek-12engineering.org/data/d17/MailSpaghetti.pdf

14) Disassemble a Click Pen, Grades 3-5
http://www.prek-12engineering.org/data/d33/clickPen.pdf

15) Construct And Test Roofs for Different Climates, Grades 3-5
http://www.prek-12engineering.org/data/d35/ClimateRoof.pdf

16) Compare Fabric Materials, Grades 3-5
http://www.prek-12engineering.org/data/d36/Fabric.pdf

17) A House is a House for Me, Grades 3-5
http://www.prek-12engineering.org/data/d52/House.pdf

18) Water Filtration, Grades 3-5
http://www.prek-12engineering.org/data/d53/Water Filtration.pdf

19) What is the Best Insulator: Air, Styrofoam, Foil, or Cotton?, Grades 3-5
http://www.prek-12engineering.org/data/d54/BestInsulator.pdf

20) Design a Recycling Game!, Grades 3-5
http://www.prek-12engineering.org/data/d55/Recycling.pdf

21) Tower Investigation and the Egg, Grades 6-8
http://www.prek-12engineering.org/data/d7/TowerEgg.pdf

22) Wimpy Radar Antenna!, Grades 6-8
http://www.prek-12engineering.org/data/d10/WimpyAntenna.pdf

23) Portable Sundial, Grades 6-8
http://www.prek-12engineering.org/data/d30/PortableSundial.pdf

24) An Introduction To Loads Acting on Structures, Grades 6-8
http://www.prek-12engineering.org/data/d31/IntroLoads.pdf

25) Design Your Own Rube Goldberg Machine, Grades 6-8
http://www.prek-12engineering.org/data/d32/RubeGoldberg.pdf

26) Building Tetrahedral Kites, Grades 6-8
http://www.prek-12engineering.org/data/d38/tetrakites.pdf

27) Do as the Romans: Construct an Aqueduct!, Grades 6-8
http://www.prek-12engineering.org/data/d39/Aqueduct.pdf

28) Build an Earthquake City!!, Grades 6-8
http://www.prek-12engineering.org/data/d40/EarthquakeCity.pdf

29) Design a Parachute, Grades 6-8
http://www.prek-12engineering.org/data/d41/Parachute.pdf

30) The Squeeze is On, Grades 6-8
http://www.prek-12engineering.org/data/d42/Squeeze.pdf

31) Stop The Stretching, Grades 6-8
http://www.prek-12engineering.org/data/d43/StopStretching.pdf

32) Speaker Project, Grades 9-10
http://www.prek-12engineering.org/data/d13/Speaker.pdf

Author(s): Erik Rushton, Emily Ryan, Charles Swift

Corporate Source: Tufts University

Publication Date:

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, Resources in Education (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.
If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options and sign in the indicated space following.

☒ Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g. electronic) and paper copy.

☐ Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only.

☐ Check here for Level 2B release, permitting reproduction and dissemination in ERIC archival collection microfiche only.

Documents will be processed as indicated provided reproduction quality permits. If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.
I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche, or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Signature: Margaret Newell

Printed Name/Position/Title: Margaret Newell, Associate Provost for Research

Organization/Address: Tufts University
136 Harrison Avenue, Suite 75K-401
Boston, MA 02111

Telephone: 617-636-6550
Fax: 617-636-2917
E-mail Address: peter.wong@tufts.edu

Date: 8/15/2003

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, or, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant this reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to:

ERIC Clearinghouse for Science, Mathematics, and Environmental Education
Acquisitions
1929 Kenny Road
Columbus, OH 43210-1080

Telephone: (614) 292-6717
Toll Free: (800) 276-0462
FAX: (614) 292-0263
e-mail: ericse@osu.edu
WWW: http://www.ericse.org

EFF-088 (Rev. 9/97)